

#### WHAT IS CLAIMED

- 1) A device for checking the position of a spindle in a machine tool presenting a structure serving to support the spindle and means by which the spindle is set in motion along three axes X, Y, and Z within a predetermined machining zone, comprising
  - a plurality of means located externally of the machine and capable of emitting electromagnetic signals;
  - means installed on the spindle and capable of receiving electromagnetic signals;
  - a master control unit, connected on the output side to the means by which the spindle is set in motion along the axes, incorporating means by which to process and transmit signals indicating the distance between each of the emitting means and the receiving means; and
  - means able to identify the position of the spindle on the basis of the signals indicating the distances between the emitting and receiving means.
- 2) A device as in claim 1, wherein each of the means emitting electromagnetic signals is associated with one of a corresponding plurality of respective time measuring means synchronized one with another.

- 3) A device as claim 2, wherein means by which to process and transmit signals indicating the distance between each of the emitting means and the receiving means are able to determine the selfsame distance on the basis of the time taken by the electromagnetic signal to travel between the emitting means and the receiving means.
- 4) A device as in claim 1, wherein the spindle is set in motion within the machining zone, by relative means, about two further polar axes A and C, and means by which to detect the orientation of the polar axes A and C are connected to processing means connected in turn on the output side to the master control unit.
- 5) A device as in claim 4, wherein the detection means comprise rotary encoders.
- 6) A device as in claim 4, wherein the detection means comprise gyroscope devices.
- 7) A device as in claims 1 to 6, wherein means capable of emitting electromagnetic signals consist in emitters of electromagnetic waves in the radio-frequency part of the spectrum, and receiving means consist in a receiving antenna.

- 8) A device as in claims 1 to 6, wherein means capable of emitting electromagnetic signals consist in transmitters of radar waves, and receiving means consist in a radar target.
- 9) A device as in claims 1 to 6, wherein means capable of emitting electromagnetic signals consist in transmitters of laser signals, and receiving means consist in a reflective target.
- 10) A device as in claims 1 to 9, installed in a system including a plurality of machine tools and relative spindles, wherein the means capable of emitting electromagnetic signals and the master control unit are embodied as a single entity operating in conjunction with each of the receiving means associated with the single spindles.
- 11) A device as in claims 1 to 10, installed in a machine tool of which the predetermined machining zone is occupied by a fixture serving to support a part for machining, wherein the fixture comprises at least one set of receiving means able to pick up the electromagnetic signals from the emitting means and connected to means capable of processing and

outputting signals indicating the distance between each of the emitting means and the receiving means.

- 12) A device as in claims 1 to 11, wherein the method of computation utilized by the processing means is that of triangulation.